



CANADIAN CIVIL ENGINEER

L'INGÉNIEUR CIVIL CANADIEN

2018 | SUMMER / ÉTÉ

- Celebrating Technical Excellence
- 2018 National Conference Review
- Getting to 30 by 30
- Gender Equality in Construction

Women in construction | Les femmes dans la construction



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On the cover: (image, Getting Images)



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Annual Subscription Rates/Abonnement annuel
Canada & U.S./E.U. \$35.00, Other countries/Autres pays \$45.00;
Single copy/Un numéro \$7.50; Agency discount/Rabais au
distributeurs 10%

PUBLICATION ISSN 9825-7515

RETURN ADDRESS/ADRESSE DE RETOUR :

The Canadian Society for Civil Engineering
La Société Canadienne de Génie Civil
521-300, rue St-Sacrement Montreal, Québec H2Y 1X4

Canadian Civil Engineer (CCE) is published five times per year by the
Canadian Society for Civil Engineering (CSCE). L'ingénieur Civil Canadien
(ICC) est publié cinq fois par année par la Société Canadienne de Génie
Civil (SCGC).

The opinions expressed in the papers are solely those of the authors
and the Canadian Society for Civil Engineering is not responsible for
the statements made in this publication. Les opinions exprimées dans
les articles sont la seule responsabilité de leurs auteurs et la Société
canadienne de génie civil n'engage pas sa responsabilité dans les
propos exprimés.

CIVIL Magazine is produced by the publishers of Canadian Consulting
Engineer Magazine, published by Annex Publishing & Printing Inc.
Le magazine CIVIL est produit par l'éditeur de la publication
Canadian Consulting Engineer qui est publiée par
Annex Publishing & Printing Inc.

CANADIAN CONSULTING
engineer

Annex Publishing & Printing Inc.,
111 Gordon Baker Road, Suite 400
Toronto, Ontario M2H 3R1
Tel.: 416-510-5111; Fax: 416-510-5140

PUBLICATIONS MAIL AGREEMENT/POSTES CANADA ENREGISTREMENT
#40065710



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Vision 2020 and Beyond

Dear Friends, Colleagues and Members

I have the esteem privilege of being your next CSCE President, as was conferred upon me at this year's annual conference held this past June in Fredericton, New Brunswick. I have been a Board member for the past 10 years and have been attending our annual conferences for many years.

To be in the company of passionate delegates is an inspiring and wonderful experience. To those engineers who impart our civil curriculum to aspiring students, to those civil engineers who achieve greatness through innovation, to those civil engineers who have paved the way for sustainable and resilient design, and to those civil engineers who enrich all of us in their contributions to humanity and indigenous awareness; I thank you all for being part of the Canadian Society for Civil Engineering.

The annual conference in Fredericton was a tremendous success. The programs associated with our students, the presentation of papers, keynote speakers, honours and awards and the local accommodations were well planned, coordinated and executed to near perfection.

Many thanks to the organizing committee, our sponsors, the volunteers and the staff at the National office. Special thanks to Mr. Lloyd Waugh & Jeff Rankin as our hosts, and to Mr. Peter George in coordinating the conference audio-visual production.

“As a learned Society our strategic direction for the future must include our continued support for designs and methods of construction that are sustainable, resilient, and innovative.”

As CSCE moves into the twilight of Vision 2020, our commitment to leadership in sustainable development published in 2010 continues to be a cornerstone of our strategic direction. Our new Board of Directors are developing new goals for its leadership, while building our membership's participation and involvement through the development of CSCE's HUB, our networking site to be launched in 2019.

As president, I will remain committed to our 2020 Vision and will work with the president elect, senior vice president, and our National office staff in enhancing our communication and educational programs for the membership. As a learned Society our strategic direction for the future must include our continued support for designs and methods of construction that are sustainable, resilient, and innovative. A commitment to better infrastructure is therefore a “vision” we can all be proud of and

benefit from economically, socially and environmentally.

I want to congratulate my predecessor Ms. Susan Tighe who provided outstanding leadership during a year of significant change in our corporate personnel and management, as well as Ms. Arkwright and Ms. Ricci in administering CSCE's transition to a new website and to our first membership renewal campaign. I want to acknowledge the effort of Mr. Alan Perks, former president of CSCE, in providing a renewed awareness in our role as engineers to the issues of accessibility.

In closing, I look forward to providing leadership to chart a new path forward for CSCE's management and programs. We must embrace a culture of change and provide for succession planning which are key to making sure novel perspectives are brought into the organization.

May we continue to "be seen, be heard, be relevant and be proud" of our society. Hope to see you all at the "Small and Medium Span Bridge conference" in Quebec City at the end of July.

Best regards. ■

Vision 2020 et au-delà

Mes chers amis, collègues et membres.

J'ai le grand privilège d'être le prochain président de la SCGC, poste qui m'a été confié lors du congrès annuel de cette année tenu en juin à Fredericton, au Nouveau-Brunswick. Je suis membre du conseil d'administration depuis dix ans et j'assiste à nos congrès annuels depuis de nombreuses années. Être en compagnie de délégués passionnés est une expérience inspirante et merveilleuse. Aux ingénieurs qui transmettent le savoir aux futurs étudiants, aux ingénieurs civils qui réalisent de grandes oeuvres grâce à l'innovation, aux ingénieurs civils qui ont ouvert la voie à un design durable et résilient, et aux ingénieurs civils qui enrichissent chacun d'entre nous de par leurs contributions à l'humanité et à la sensibilisation autochtone, je vous remercie de faire partie de la Société canadienne de génie civil.

Le congrès annuel de Fredericton fut un très grand succès. Les programmes destinés à nos étudiants, la présentation des communications, les conférenciers, les distinctions et les prix ainsi que les emménagements furent bien planifiés et coordonnés et le tout réalisé près de la perfection. Un grand merci au comité organisateur, à nos commanditaires, aux bénévoles et au personnel du Bureau national. Je remercie aussi nos hôtes, MM. Lloyd Waugh et Jeff Rankin et M. Peter George pour la coordination de la production audio-visuelle.

Alors que nous avançons vers le crépuscule de la Vision 2020, notre engagement pour exercer le leadership en matière de développement durable publié en 2010 continue d'être la pierre angulaire de notre orientation stratégique. Notre nouveau conseil d'administration élabore de nouveaux objectifs pour ses dirigeants, tout en renforçant la participation et l'implication de nos membres grâce au développement du site de réseautage HUB de la SCGC qui sera lancé 2019.

En tant que président, je reste fidèle à notre Vision 2020 et je travaillerai avec le président élu, le vice-président principal et le personnel de notre Bureau national pour améliorer nos programmes de communication et de formation pour les membres. En tant que Société savante,

<<En tant que Société savante, notre orientation stratégique pour l'avenir doit inclure notre soutien continu aux conceptions et aux méthodes de construction durables, résilientes et innovantes.>>

notre orientation stratégique pour l'avenir doit inclure notre soutien continu aux conceptions et aux méthodes de construction durables, résilientes et innovantes. Un engagement en faveur de meilleures infrastructures est donc une «vision» dont nous pouvons tous être fiers et bénéficier sur les plans économique, social et environnemental.

Je tiens à féliciter ma prédécesseure, Mme Susan Tighe, qui a fait preuve d'un leadership remarquable pendant une année marquée par des changements importants au sein de notre personnel et de notre direction, ainsi que Mme Arkwright et Mme Ricci pour l'administration du site Web de la SCGC et pour la première campagne de renouvellement des adhésions. Je tiens à souligner les efforts déployés par M. Alan Perks, ancien président de la SCGC, pour accroître notre sensibilisation aux questions d'accessibilité.

En terminant, j'ai hâte de faire preuve de leadership afin de tracer une nouvelle voie pour la gestion et les programmes de la SCGC. Nous devons adopter une culture de changement et prévoir une planification de la relève qui est la clé pour s'assurer que de nouvelles perspectives sont introduites dans l'organisation.

Puissions-nous continuer à «être vus, être entendus, être pertinents et fiers» de notre société. Au plaisir de vous voir tous à la Conférence sur les ponts de petite et moyenne portée à Québec, à la fin de juillet.

Meilleures salutations ■



Unprecedented Student Participation in Fredericton

Charles-Darwin Annan, Ph.D., P.Eng.
Chair, CSCE Student Affairs Committee

The 2018 CSCE Annual conference in Fredericton, NB, in mid-June recorded an unprecedented participation of CSCE student members from every corner of Canada. In fact, the experience as expressed by the students themselves was beyond just participation. For CSCE, it was a huge step forward in achieving its core strategic direction to grow with the youth.

As National Chair of Student Affairs, I would like to thank my committee members, the Young Professionals (YP) team, and every volunteer who worked diligently to ensure this great success and to provide the right platform for our students to initiate valuable professional contacts.

Congratulations to UBC Vancouver for winning the President's Award for the most Outstanding CSCE Student Chapter; Western and BCIT Student Chapters scooped second and third places, respectively; Concordia and Laval made the most significant improvement, and UNB and Waterloo received honourable mentions for the most consistent performance. Martin Bolo, faculty advisor for BCIT Student Chapter, received a Certificate of Commendation for his outstanding contribution to his Chapter.

Congratulations also go to Université de Sherbrooke for winning the National Civil Engineering Capstone Design Competition; UBC

Okanagan and Memorial University of Newfoundland for taking second and third places, respectively. École de Technologie Supérieure (ETS) was the winner of both the Canadian National Concrete Canoe and the Canadian National Steel Bridge competitions. Congratulations, ETS.

Individual students also made their mark in the student research paper and presentation competition. Congratulations to: Laurent Gérin from University of Waterloo for winning the Structural Specialty Award; Thomas MacLean from University of New Brunswick for winning the Materials Specialty Award; Timothy Vogel from University of Saskatchewan for winning the Environmental Specialty Award; Jacob Stolle from University of Ottawa for winning the Disaster Mitigation specialty Award; Danny Haines from University of Calgary for winning the Transportation Specialty Award; and Henry Helmer-Smith from Royal Military College of Canada for winning in the General Conference category.

This is the time to get involved. This is the time to make your FREE student membership count and be part of a rewarding experience. Get involved in your CSCE Student Chapter today and begin those lifelong and valuable professional contacts.

Dr. Charles-Darwin Annan is an associate professor of civil engineering at Université Laval and can be reached at Charles-darwin.annan@gci.ulaval.ca ■



Students selected to represent their schools in the National Civil Engineering CAPSTONE Design competition, with the panel of judges. Étudiants représentant leurs universités au Concours national Capstone de conception en génie civil avec le jury.

Participation étudiante record à Fredericton

Charles-Darwin Annan, Ph.D., P.Eng.
Président, Comité des affaires étudiantes

Le congrès annuel de la SCGC, tenu à Fredericton (N.-B.) en juin 2018, a enregistré une participation record de membres étudiants de la SCGC des quatre coins du Canada. Les étudiants ont indiqué que leur expérience allait au-delà d'une simple participation. Pour la SCGC, ce fut un grand pas en avant dans la réalisation de son orientation stratégique de base pour croître avec les jeunes.

En ma qualité de président du Comité des affaires étudiantes, je tiens à remercier les membres de mon comité, l'équipe des jeunes professionnels et tous les bénévoles qui ont travaillé avec diligence pour assurer cette réussite et fournir à nos étudiants la plateforme idéale pour établir de précieux contacts professionnels.

Je félicite UBC Vancouver d'avoir remporté le Prix du président pour la section étudiante exceptionnelle de la SCGC. Les sections étudiantes de l'Université Western et du BCIT ont remporté respectivement les deuxième et troisième places; les universités Concordia et Laval ont réalisé l'amélioration la plus significative, et l'UNB et Waterloo ont reçu des mentions honorables pour le rendement le plus constant. Martin Bolo, conseiller du corps professoral du chapitre étudiant du BCIT, a reçu un certificat de mérite pour sa contribution exceptionnelle à sa section.

Je félicite également l'Université de Sherbrooke qui a remporté le Concours national Capstone de conception en génie civil, ainsi que UBC Okanagan et Memorial University of Newfoundland, respectivement deuxième et troisième places. L'École de technologie supérieure (ÉTS) a remporté le Concours national de canoë de béton et le Concours national de pont d'acier. Bravo ÉTS!

Les étudiants individuels ont également fait leur marque dans le concours de la recherche et de la document de recherche. Félicitations à: Laurent Gérin de l'Université de Waterloo pour son Prix de la spécialité en structures; Thomas MacLean de l'Université du Nouveau-Brunswick pour le Prix de la spécialité en matériaux; Timothy Vogel de l'Université de la Saskatchewan pour le Prix de la spécialité en environnement; Jacob Stolle de l'Université d'Ottawa pour le Prix de la spécialité en atténuation des catastrophes; Danny Haines de l'Université de Calgary pour le Prix de la spécialité en transport; et Henry Helmer-Smith du Collège militaire royal du Canada pour son prix dans la catégorie Con-



Leaders from different CSCE Student Chapters who participated in the Student Chapter Leaders Workshop. Dirigeants de divers chapitres étudiants qui ont participé à l'atelier des dirigeants des chapitres étudiants

grès général.

C'est le moment de vous impliquer. C'est le moment de faire en sorte que votre adhésion GRATUITE compte et vous permette de vivre une expérience enrichissante. Impliquez-vous dans votre chapitre étudiant de la SCGC dès aujourd'hui et entamez des contacts professionnels durables et précieux.

Le Dr Charles-Darwin Annan est professeur agrégé de génie civil à l'Université Laval et peut être contacté à charles-darwin.annan@gci.ulaval.ca. ■

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Young Professional Women in Engineering: 30 by 30

Nicholas C. Kaminski, P.Eng., PMP, MCSCE
CSCE Young Professionals Committee Chair

As part of the Engineers Canada 30 by 30 initiative it is incredibly important that we as young professionals take the lead on advocating for young women to enter the engineering workforce.

30 by 30 is the commitment made by Engineers Canada, in collaboration with the 12 provincial and territorial engineering regulators, to raise the percentage of newly licensed engineers who are women to 30% by the year 2030.

Women are significantly underrepresented in the engineering profession while making up more than half of the general population. Gender diversity has proven value in the workplace for innovation, creativity, and economic competitiveness. An elevated level of gender diversity has the potential to bring better solutions to engineering problems. It is imperative that we as engineers bring as much exposure to the topic of gender diversity in our profession as possible.

I had the opportunity to interview Stavroula Giannaris, B.Sc. (Chem), B.A.Sc., M.Eng., E.I.T. who is currently based in Regina, Saskatchewan working with the International CCS (Carbon Capture and Storage) Knowledge Centre with SaskPower.

Stavroula started in university as a chemistry major and after graduating she transitioned into Petroleum Engineering. Stavroula graduated from the University of Regina with both her Bachelor's degree in 2015 and her Master of Engineering in 2018. Below is an excerpt from our interview session.

What do you think would make engineering more attractive to women who are considering entering the field?

Advertising the career diversity that comes with being an engineer. I think most people think it is eight hours a day of calculations, but there is a whole social aspect to the job that I think isn't relayed to future students.

Did you see or experience any barriers before entering the engineering field? Do you see any now?

No, if anything it is a plus. Sure, you stick out at first – I've been in meetings where I'm not only the youngest engineer in the room, but also the only female in the room. It can be intimidating but in my experience, everyone has been very friendly and eager to hear my story.

What can primary education, universities and regulators improve upon to advocate better for women to enter engineering fields?

Ensuring that young girls and women know engineering IS a job option for them. When I started university, I didn't know what engineers did, hence I took the scenic route via "chemistry lane".

Do you think having more female engineers in the workforce will allow for more diverse solutions to be created for the betterment of society? If so, why?

As with any problem solving based industry, I believe diversity brings more options to the table, which enables better decision-making. Women tend to be more group oriented and innately better at communication. We can be more nurturing as well which I think is key – as engineers we must hold paramount the safety of human life and the environment.

What advice do you have for other young women who are considering the engineering field?

Do it, and once you've started Just. Keep. Going.

The Young Professionals Committee is always happy to answer any questions and provide assistance whenever it can. Contact information for our members is on the CSCE's website. ■ kaminski.nick@icloud.com

Les jeunes professionnelles en ingénierie: 30 par 30

Nicholas C. Kaminski, P.Eng., PMP, MSCGC
Président, Comité des jeunes professionnels

Dans le cadre de l'initiative «30 par 30» d'Ingénieurs Canada, il est extrêmement important qu'en tant que jeunes professionnels, nous fassions la promotion de l'entrée des jeunes femmes dans la main-d'œuvre en génie.

30 par 30 est l'engagement pris par Ingénieurs Canada, en collabora-

tion avec les 12 organismes de réglementation du génie civil provinciaux et territoriaux, de faire en sorte que les femmes constituent 30% des nouveaux diplômés d'ici 2030.

Les femmes sont nettement sous-représentées dans la profession alors qu'elles constituent plus de la moitié de la population générale. La di-

versité des genres a prouvé sa valeur sur le lieu de travail pour l'innovation, la créativité et la compétitivité économique. Un niveau élevé de diversité des genres a le potentiel d'apporter de meilleures solutions aux problèmes d'ingénierie. Il est impératif qu'en tant qu'ingénieurs nous puissions faire avancer autant que possible la diversité des genres dans notre profession.

J'ai eu l'opportunité de faire une entrevue avec Stavroula Giannaris, B.Sc. (Chem), B.A.Sc., M.Eng., E.I.T., qui travaille au Centre du savoir du CCS (Captage et stockage du carbone) international de SaskPower à Regina, en Saskatchewan.

Après avoir obtenu un Baccalauréat en chimie, Stavroula a étudié le génie du pétrole et obtenu un baccalauréat en 2015 et une maîtrise en 2018. Voici un extrait de notre entrevue.

Selon vous, qu'est-ce qui rendrait l'ingénierie plus attrayante pour les femmes qui envisagent de s'y consacrer?

Faire la publicité de la diversité de carrière liée à la profession d'ingénieure. Je pense que la plupart des gens pensent que c'est huit heures par jour de calculs, mais il y a tout un aspect social à l'emploi qui, selon moi, n'est pas transmis aux futurs étudiants.

Avez-vous vu ou rencontré des obstacles avant d'entrer dans le domaine de l'ingénierie? En voyez-vous maintenant?

Non, c'est plutôt un avantage. Bien sûr, au début il faut tenir; j'ai assisté à des réunions où j'étais non seulement le plus jeune ingénieur dans la pièce, mais aussi la seule femme dans la pièce. Cela peut être intimidant mais d'après mon expérience, tout le monde a été très amical et désireux d'entendre mon histoire.

Que peuvent améliorer l'éducation primaire, les universités et les régulateurs pour mieux promouvoir la place des femmes dans les domaines de l'ingénierie?

S'assurer que les jeunes filles et les femmes en général savent que l'ingénierie est une option de profession. Quand je suis entrée à l'université, je ne savais pas ce que les ingénieurs faisaient. Je me suis alors engagée sur le boulevard par «le chemin de la chimie».

Pensez-vous que le fait d'avoir plus d'ingénieures sur le marché du travail permettra de créer des solutions plus diverses pour le bien de la société? Si oui, pourquoi?

Comme pour toute industrie basée sur la résolution de problèmes, je crois que la diversité apporte plus d'options à la table, ce qui permet une meilleure prise de décision. Les femmes ont tendance à être plus orientées vers le groupe et mieux intégrées dans la communication. Nous pouvons aussi être plus stimulantes, ce qui, à mon avis, est essentiel. Nous devons, en tant qu'ingénieurs, préserver la sécurité de la vie humaine et de l'environnement.

Quels conseils avez-vous pour les autres jeunes femmes qui envisagent le domaine de l'ingénierie?

Faites-le, et une fois que vous avez commencé, gardez le cap.

Le comité des jeunes professionnels est toujours heureux de répondre aux questions que vous pourriez avoir et de vous aider chaque fois que possible. Les coordonnées de nos membres peuvent être consultées sur le site Web de la SCGC. ■

kaminski.nick@icloud.com



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CELEBRATING CANADA'S CIVIL ENGINEERING TECHNICAL EXCELLENCE

LA SCGC CÉLÈBRE L'EXCELLENCE EN GÉNIE CIVIL

Each year, the Canadian Society for Civil Engineering recognizes members for their career achievements and for the excellence of their technical papers. The following members were recognized for their achievements at the Awards for Civil Engineering Excellence Gala in Fredericton, on June 15, 2018. CSCE extends its congratulations to all award recipients. The 2018 Awards Booklet and Awards Gala photos are available on www.csce.ca (Honours and Fellowships webpage).

Chaque année, la Société canadienne de génie civil rend hommage à ses membres qui se sont distingués pour l'ensemble de leur carrière ou pour la qualité de leurs communications techniques. Les personnes suivantes furent célébrées pour leurs réalisations au Gala des prix de l'excellence en génie civil du 15 juin 2018 à Fredericton. La SCGC présente ses chaleureuses félicitations à tous les récipiendaires. Le livret des prix et les photos du Gala des prix 2018 sont disponibles sur www.csce.ca (page Distinctions honorifiques et fellowships).

New Fellows of the Canadian Society for Civil Engineering / Fellows de la Société canadienne de génie civil:

Robert C. Andrews FCSCE, Toronto, ON;
Hans Arisz FCSCE, Fredericton, NB;
Omar Chaallal FCSCE, Montréal, QC;
George Chi-Wai Cheng FCSCE, Hong Kong;
Ana Maria da Silva FCSCE, Kingston, ON;
Raafat El-Hacha FCSCE, Calgary, AB;

Mario Fafard FCSCE, Québec, QC;
Stephen P. A. Grainger FCSCE, St. John's, NL;
Glenn Hewus FCSCE, Ottawa, ON;
Andrew Horosko FCSCE, Winnipeg, MB;
Burkan Isgor FCSCE, Corvallis, OR, USA;
Guy Mailhot FCSCE, Montréal, QC;
Dan Palermo FCSCE, Toronto, ON;

Bruce Peberdy FCSCE, Regina, SK;
Bernard Trevor FCSCE, Edmonton, AB;
Wade Zwicker FCSCE, Edmonton, AB;
Richard G. Zytner FCSCE, Guelph, ON.



Featured keynote speaker, Dr. B.F. Spencer, from the University of Illinois at Urbana-Champaign, addressed the topic of state-of-the-art bridge monitoring. His talk stressed the importance of structural health monitoring in managing bridge infrastructure.



2018 CSCE Fellows, Career Award and Best Paper Award winners.

2018 Career Awards / Prix de carrière 2018

Sandford Fleming Award / Prix Sandford Fleming: Baher Abdulhai

Horst Leipholtz Medal / Médaille Horst Leipholtz:

Shamim Sheikh

A.B. Sanderson Award / Prix A.B. Sanderson:

F. Michael Bartlett

Walter Shanly Award / Prix Walter Shanly: Mohamed Attalla

James A. Vance Award / Prix James A. Vance: John Newhook

W. Gordon Plewes Award / Prix W. Gordon Plewes:

Kenneth Johnson

Young Professional Engineer Award / Prix du jeune ingénieur professionnel: Thomas Mara

Stephen G. Revay Award / Prix Stephen G. Revay: Tarek Salama, Ahmad Salah, Osama Moselhi

Thomas C. Keefer Medal / Médaille Thomas C. Keefer:

Biswajit Nandi, Pamela Chelme-Ayalam, Mark Loewen,

Mohamed Gamal El-Din

Casimir Gzowski Medal / Médaille Casimir Gzowski: Ian

Jordaan, Kevin Hewitt, Robert Frederking



Among 17 new Fellows was Wade Zwicker, pictured receiving his honour from past-president Susan Tighe.



Lloyd Waugh (front row left), Chair of CSCE 2018 Conference, along with the entire organizing team receiving Certificates of Appreciation.



Following tradition, all past-presidents in attendance at the national conference were recognized: (l-r): Lloyd Waugh; Alistair MacKenzie; Jim Kells; Vic Perry; Cathy Lynn Borbely; Susan Tighe; Jim Gilliland; Randy Pickle; Gordon Jin; and Tony Bégin.



CSCE Past-President Susan Tighe presents the distinction of Fellow to incoming CSCE President for 2018-2019, Glenn Hewus.

CSCE 2019 National Honours and Awards – Call for Nominations

Nominations are invited at any time for the awards listed below. Complete nominations must be received by November 15, 2018 (except where noted) to be considered for the 2019 awards to be presented at the CSCE Annual Conference in Montreal-Laval in June 2019.

Please submit nominations, clearly stating the award for which the nomination is made, by e-mail to: Lyanne St Jacques, Communications Manager at lyanne.stjacques@csce.ca.

A.B. Sanderson Award

Recognizes outstanding contributions by a civil engineer to the development and practice of structural engineering in Canada.

Albert E. Berry Medal

Recognizes significant contributions by a civil engineer to the field of environmental engineering in Canada.

Camille A. Dagenais Award

Recognizes outstanding contributions by a civil engineer to the development and practice of hydrotechnical engineering in Canada.

E. Whitman Wright Award

Recognizes significant contributions by a civil engineer to the development of computer applications in civil engineering in Canada.

Horst Leipholz Medal

Recognizes outstanding contributions by a civil engineer to engineering mechanics research and/or practice in Canada.

Sandford Fleming Award

Recognizes outstanding contributions by a civil engineer to transportation engineering research and/or practice in Canada.

Walter Shanly Award

Recognizes outstanding contributions by a civil engineer to the development and practice of construction engineering in Canada.

W. Gordon Plewes Award

Recognizes particularly noteworthy contributions by an individual to the study and understanding of the history of civil engineering in Canada, or civil engineering achievements by Canadian engineers elsewhere. Normally, the recipient will be an individual, not necessarily an engineer, but in special circumstances the award can be given to an organization.

Young Professional Award

Awarded annually to a CSCE Member or Associate Member who has demonstrated outstanding accomplishments as a young professional engineer. Normally, nominees must be no older than 35 as of December 31 of the year that the award is presented, although this limit may be extended for nominees who have taken extended leaves from professional practice.

(Deadline for nominations is January 15, 2019).



First Place, Student Best Paper: (l-r) Susan Tighe; Timothy Vogel (University of Saskatchewan); Benjamin McGuigan, Competition Coordinator.



Honourable Mention, Student Best Paper: (l-r) Susan Tighe; Jiaru Luo (Concordia University); and Benjamin McGuigan.



President Award for Best Student Chapter: (l-r) Susan Tighe; Arjun Singh (UBC Vancouver); and Charles Darwin Annan, Chair of the Student Affairs Committee.



First Place, Capstone Competition: (l-r) Susan Tighe; Virginie Simard, Justine Sirois, Alice Boisvert-Chapdelaine (Université de Sherbrooke); and Andrew Horosko, Chair of the Capstone Selection Committee.

Distinctions honorifiques et prix 2019 de la SCGC – Appel aux candidatures

Les membres sont invités à soumettre en tout temps des candidatures pour les prix ci-dessous. Les candidatures soumises d'ici le 15 novembre 2018 (sauf indication contraire) seront considérées pour les prix 2019 qui seront décernés au congrès annuel de la SCGC à Montréal-Laval en juin 2019.

Veuillez soumettre les candidatures, en précisant le titre du prix, par courriel à: Lyanne St Jacques, directrice des Communications à lyanne.stjacques@csce.ca.

Le Prix A.B. Sanderson

Est décerné aux ingénieurs civils qui se sont distingués par leur contribution exceptionnelle au développement et à la pratique du génie des structures au Canada.

La Médaille Albert Berry

Souligne l'importante contribution d'un ingénieur civil au génie de l'environnement au Canada.

Le Prix Camille A. Dagenais

Est décerné aux ingénieurs civils qui se sont signalés par leur contribution exceptionnelle au développement et à la pratique de l'hydrotechnique au Canada.

Le Prix E. Whitman Wright

Est décerné à un ingénieur civil qui s'est distingué par son importante contribution au développement des applications de l'informatique au génie civil au Canada.

La Médaille Horst Leipholz

Est décernée à un ingénieur civil qui s'est distingué par son importante contribution à la recherche et/ou à la pratique de la mécanique appliquée au Canada.

Le Prix Sandford Fleming

Est décerné à un ingénieur civil qui s'est distingué par son importante contribution à la recherche et/ou à la pratique du génie du transport au Canada.

Le Prix Walter Shanly

Est décerné à un ingénieur civil qui s'est distingué par son importante contribution au développement et/ou à la pratique du génie de la construction au Canada.

Le Prix W. Gordon Plewes

Est décerné à une personne, qui n'est pas nécessairement un ingénieur, qui s'est distinguée par sa contribution à l'étude de l'histoire du génie civil au Canada ou de l'histoire des réalisations canadiennes en matière de génie civil à travers le monde. Dans des circonstances exceptionnelles, le prix peut être décerné à une organisation.

Le Prix du jeune ingénieur professionnel

Attribué annuellement à un membre ou à un membre associé de la SCGC ayant accompli des réalisations exceptionnelles en tant que jeune ingénieur professionnel. Les candidats doivent être âgés de 35 ans ou moins au 1er décembre de l'année de l'attribution du prix. Toutefois, cette limite peut être prorogée pour les candidats qui ont pris des congés prolongés.

(Date limite de soumission : 15 janvier 2019).



Second Place, Capstone Competition: (l-r) Susan Tighe; Shena Changirwa and Julianna Neudorf (UBC Okanagan); and Andrew Horosko.



Third Place, Capstone Competition: (l-r) Susan Tighe; Julie Quirke and Kendra Bursey (Memorial University); and Andrew Horosko..



Trade show activity during the conference.

What Lies Ahead?

Summary of interactive panel discussion held at 2018 Annual Conference-Fredericton

Participants:

Alan Perks, Moderator: CSCE President's Task Force on Accessibility.
Marty Janowitz, Stantec Halifax: Sustainability, Resilience & Avoidance.
Dr. Anna Robak, OPUS/WSP: Research, Innovation & Future Ready.
Dr. Katy Haralampides, UNB: Inclusivity, Diversity, Social Justice.
Dr. Janice Gillis, PEI Council of People with Disabilities

Within the theme of the 2018 Conference, this panel addressed several serious, urgent and growing issues for the profession, and for society: a) Sustainability and Innovation; b) Inclusivity and Social Justice; and c) Accessibility & Universal Design of the Built Environment. The intent was to build awareness and motivation within the CSCE to address these issues, identify where the profession may be “missing the boat”, and what may lie ahead if not addressed.

Alan Perks stressed the urgency of the issues being addressed. He underlined what lies ahead by pointing out that in 2017 the concentration of CO₂ in the atmosphere increased 45% over pre-industrial levels and will likely reach levels where human health is affected by breathing “fresh air”.

Marty Janowitz talked about Sustainability, Resilience & Avoidance by presenting an artist's surreal image of a complex ‘medieval’ city balanced precariously on a thin pedestal of metal pipes. He questioned whether conventional approaches to urban design and engineering are sufficient or appropriate at this time of severe change and challenge.

Dr. Anna Robak promoted a shift of our engineering approach from designing for people to designing with people, as our problems shift from big and centralized to smaller and distributed. She argued for injecting behavioural science into our practice as the critical connective tissue between infrastructure and the people they serve.

Dr. Katy Haralampides spoke on Inclusivity, Diversity, and Social Justice. Her message included the need to increase the diversity of engineering students and incorporate princi-

ples of equity and social justice throughout the core of the engineering curriculum in order to change the profession to one that works positively and meaningfully. Sometimes the simple, low-tech solutions have the best outcomes in every way, she pointed out.

Dr. Janice Gillis, speaking on “Infrastructure from a Wheelchair”, provided insight and perspective on daily life and challenges faced by persons using wheelchairs. She advocated for going ‘beyond the codes’ when it comes to civil infrastructure design, and for adoption of 7 Universal Design Principles to meet the needs of all members of society.

The panel discussions served to ask if CSCE, a community of active and impactful professionals, who could have disproportionate impact on directions and models in the realm of infrastructure, can rise to the occasion in new ways with new collaborations?

It was noted that the CSCE Presidents since 1994 have been increasingly issuing a “call to action” to the profession on these critical issues; the most recent initiatives being this panel at an Annual CSCE Convention, and the recently struck CSCE President's Task Force on Accessibility. The panel discussion represented a renewed “call to action” for the

profession to address all these issues.

Audience engagement was enthusiastic and positive. Many reported this panel as a highlight of the conference. There were provocative and emotionally-charged questions about engineering benefit-cost decisions and this was truly eye opening for everyone attending. One participant wrote that it was impressive CSCE held a panel of this nature, and expressed heartfelt congratulations.

In reviewing and summarizing the comments received, one is left with the overriding theme that “We can do better!”

We can do better by:

- Asking “should we?” after identifying a “technically excellent” solution, to verify it will better our built /natural environments.
- making end users central to, and present in, our civil engineering teaching curricula;
- broadening our perspective in design;
- reaching out to others in devising sustainable solutions;
- seeking the inclusion of all persons/cultures in the profession and in design outcomes;
- recognizing impacts of infrastructure on the disadvantaged - homeless, sick and mentally ill;
- and adopting universal design principles that address the needs of all persons with special accessibility needs.

The Call to Action emerging from this discussion is that Civil Engineering must benefit all of human society. This resonates fully with the Call to Action issued by CSCE President Claude Johnson in Beijing in 1994. And in considering this, the panel is now formulating recommendations to be published and presented to the President and Directors of the CSCE for further action. ■



Panel discussion moderated by Alan Perks (left) with (l-r): Dr. Janice Gillis; Dr. Anna Robak; Dr. Katy Haralampides; and Marty Janowitz.

Ce qui nous attend?"

Résumé de la table ronde interactive tenue au Congrès annuel 2018 de Fredericton

Participants:

Alan Perks, Modérateur: Groupe de travail du président sur l'accessibilité, SCGC

Marty Janowitz, Stantec Halifax: Durabilité, résilience & évitement

La Dre Anna Robak, OPUS/WSP: Recherche, innovation & prêts pour l'avenir

La Dre Katy Haralampides, UNB: Inclusion, diversité, justice sociale

La Dre Janice Gillis, Conseil des personnes handicapées de l'Î-P-É

Dans le cadre du thème du congrès 2018 de la SCGC, cette table ronde a abordé plusieurs questions sérieuses, urgentes et qui prennent de l'ampleur pour la profession et pour la société: a) durabilité et innovation; b) inclusion et justice sociale; c) accessibilité et conception universelle de l'environnement bâti. L'intention était de sensibiliser et de motiver la SCGC pour qu'elle traite ces questions, d'identifier là où la profession pourrait «manquer le bateau» et les conséquences si ces questions n'étaient pas abordées.

Le modérateur du panel, Alan Perks a notamment souligné l'urgence des problèmes qui se posent. Il a insisté sur l'urgence de ce qui nous attend en relevant qu'en 2017, la concentration de CO2 dans l'atmosphère a augmenté de 45% par rapport aux niveaux préindustriels. Elle atteindra probablement des niveaux auxquels la santé humaine sera affectée par la respiration de «l'air frais».

Marty Janowitz a discuté de durabilité, de résilience et d'évitement en présentant l'image surréaliste d'une ville «médiévale» complexe, en équilibre précaire sur un mince socle de tuyaux métalliques. Il s'est interrogé pour savoir si les approches conventionnelles en matière de conception et d'ingénierie urbaines étaient suffisantes ou appropriées en ce temps d'importants changements et défis.

La Dre Anna Robak a plaidé pour un changement de notre approche de l'ingénierie pour évoluer d'une conception pour les gens vers une conception avec les gens, alors que nos problèmes ne sont plus importants et centralisés mais deviennent moins importants et partagés. Elle a préconisé l'introduction de la science comportementale dans

notre pratique comme lien critique entre infrastructures et les personnes qu'elles servent.

La Dre Katy Haralampides a abordé les questions d'inclusion, de diversité et de justice sociale. Son message incluait la nécessité d'accroître la diversité des étudiants en génie et d'incorporer les principes d'équité et de justice sociale au cœur du programme d'études en génie afin que la profession fonctionne de manière positive et significative. Parfois, les solutions simples et peu technologiques ont les meilleurs résultats sous toutes les formes, a-t-elle souligné.

La Dre Janice Gillis a présenté un aperçu de la vie quotidienne et des difficultés que rencontrent les personnes en fauteuil roulant dans sa présentation intitulée «Infrastructures ... à partir d'un fauteuil roulant». Elle a préconisé d'aller «au-delà des codes» en matière de conception des infrastructures civiles et d'adopter sept Principes de conception universels pour répondre aux besoins de tous les membres de la société.

Les discussions ont permis de se demander si la SCGC, une communauté de professionnels actifs et qui ont leur influence pouvant avoir un impact disproportionné sur les orientations et les modèles dans le domaine des infrastructures, peut se montrer à la hauteur en trouvant de nouvelles façon de faire avec de nouvelles collaborations. Il a été noté que depuis 1994 les présidents de la SCGC ont de plus en plus lancé un «appel à l'action» à la profession sur ces questions cruciales. Les initiatives les plus récentes sont cette table ronde organisée dans le cadre d'un congrès annuel de la SCGC et le Groupe de travail du président de la SCGC sur l'accessibilité

récemment créé. La table ronde représente un nouvel «appel à l'action» renouvelé pour que la profession aborde toutes ces questions.

La participation du public a été enthousiaste et positive. Plusieurs intervenants ont déclaré que cette table ronde constituait un point fort du congrès, qu'elle avait soulevé des questions provocatrices et émotionnelles sur les décisions liées aux coûts et avantages en ingénierie et qu'elle était un vrai révélateur pour tous les participants. L'un d'eux a écrit qu'il était absolument impressionnant que la SCGC ait tenu une table ronde de cette nature et lui a exprimé ses sincères félicitations.

Un examen et un résumé des commentaires reçus indiquent qu'ils portaient sur un thème dominant: «Nous pouvons faire mieux!» Nous pouvons faire mieux en:

- nous demandant: «devrions-nous?» après avoir identifié une solution «techniquement excellente» afin de nous assurer qu'elle améliore nos environnements bâtis et naturels;
- s'assurant que les utilisateurs finaux sont au cœur des programmes d'enseignement en génie civil ;
- élargissant notre perspective de la conception;
- s'approchant des autres pour concevoir des solutions durables;
- recherchant l'inclusion de toutes les personnes et les cultures dans la profession et dans les résultats de conception;
- reconnaissant les impacts de nos infrastructures sur les personnes défavorisées, c'est-à-dire les sans-abri et les malades mentaux; et
- adoptant des principes universels de conception qui répondent aux attentes de toutes les personnes ayant des besoins spécifiques en matière d'accessibilité.

L'appel à l'action qui ressort clairement de cette discussion est que le génie civil doit bénéficier à toute la société. Cela correspond pleinement à l'appel à l'action lancé par le président de la SCGC, Claude Johnson, à Beijing en 1994. Les membres de la table ronde vont maintenant formuler des recommandations qui seront publiées et présentées au président et aux dirigeants de la SCGC pour de nouvelles initiatives. ■



Women in Construction

Farnaz Sadeghpour,
Associate Professor, Department of Civil Engineering, University of Calgary

The idea of dedicating an issue of this magazine to the role of Women in Construction was first suggested back in 2015 when I was co-chair of the International Construction Specialty Conference in Vancouver, and now here we are! This section of the issue is composed of five mini articles:

- Dr. Brenda McCabe provides a background on the gender gap in the post-secondary civil engineering education in Canada and offers recommendations for moving towards a more gender-balanced environment.
- Dr. Linda Newton describes her personal journey from being in the first class of women to enter and graduate from Royal Military College to many other career firsts, along with the challenges she faced and lessons she learned.
- Madeleine Santia shares details from her own engineering intern-

ship and other female interns in this article that offers an honest and an eye-opening perspective that many of us may not be aware of.

- Dr. Sheryl Staub French speaks about the need for an exponential shift to achieve gender parity and “equal representation at the table”.
- And finally, I take a closer look at the extent of gender inequality in the construction Industry and some of the myths around women’s lack of interest or focus in this field.

I absolutely enjoyed working on this issue. My email conversations with the authors were very rewarding, and collectively the articles showcase different “points of view” on this topic. I invite you to read the articles and after each one reflect on how you can make a difference. And if you feel so inclined, do write to us and let us know your thoughts. ■

farnaz@ucalgary.ca

Les femmes dans la construction

Farnaz Sadeghpour,
Professeure agrégée, Département de génie civil, Université de Calgary

L'idée de consacrer un numéro de cette revue au rôle des femmes dans la construction fut suggérée pour la première fois en 2015 lorsque je coprésidais la Conférence internationale spécialisée en construction à Vancouver, et aujourd'hui nous y sommes! Cette section du numéro est composée de cinq mini-articles:

- La Dre Brenda McCabe présente les antécédents de l'écart entre les sexes dans l'enseignement post-secondaire en génie civil au Canada et offre des recommandations pour évoluer vers un environnement plus équilibré entre les sexes.
- La Dre Linda Newton décrit son cheminement personnel depuis qu'elle a fait partie de la première cohorte de femmes à être entrées au Collège militaire royal et y avoir obtenu un diplôme. Elle raconte aussi les nombreuses expériences professionnelles inédites, ainsi que les défis qu'elle a affrontés et les leçons qu'elle a tirées.
- Madeleine Santia partage les détails de son stage d'ingénieure et l'expérience d'autres stagiaires dans un article qui offre une per-

spective honnête et révélatrice dont beaucoup d'entre nous ne sont peut-être pas conscients.

- La Dre Sheryl Staub French aborde la nécessité d'un changement exponentiel pour atteindre la parité entre les sexes et «une représentation égale à la table».
- Enfin, j'examine de plus près l'étendue de l'inégalité entre les sexes dans l'industrie de la construction et certains des mythes entourant le manque d'intérêt ou d'intérêt des femmes pour ce domaine.

J'ai vraiment apprécié travailler sur cette question. Mes conversations par courriel avec les auteures ont été très enrichissantes, et collectivement, les articles présentent différents «points de vue» sur ce sujet. Je vous invite à lire les articles et réfléchir à la façon dont vous pouvez faire une différence. Et si vous le souhaitez, écrivez-nous et faites-nous part de vos pensées. ■

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Getting to 30 by 30

Brenda McCabe, Ph.D., P.Eng., FCSCE, FEIC Professor, Department of Civil and Mineral Engineering, University of Toronto

In 2015, Engineers Canada launched its 30 by 30 initiative, which aims to increase the proportion of women within the newly licensed engineers to 30% by the year 2030. Can we get there?

From 2008-2013, I had the privilege of being the first female Chair of Civil Engineering at University of Toronto in its 130-year history.

In the hall outside of the main offices, we have what I affectionately call the “Wall of Rogues”, which displays the pictures of all previous Department Chairs, starting with John Galbraith in 1878. The practice is to put the Chair’s picture up on the wall at the end of their term—probably to save money by not having to send the plaque to the engraver a second time for the end of term date to be added.

Breaking in tradition, our Dean suggested that I put my picture up at the start of my term to show the change in leadership. So I did. I had my picture taken, framed, and hung up on the wall. I looked proudly at the pictures. John Galbraith was admirably stern. So was the next gentleman, and the next one ... and the next one! At the end of the line, there I was, smiling away. Then I figured it out. I was the only one smiling because I had my picture taken at the start of my term, not at the end!

As Chair, I became interested in learning about the first women to graduate from our program. I also asked Chairs and Heads of other Canadian civil engineering programs to identify their first female graduate, which resulted in an interesting timeline.

The first woman to graduate from a Canadian civil engineering program was at University of Manitoba in 1946, followed closely by both New Brunswick and Toronto in 1947, and Alberta in 1948 (figure 1). I find it interesting

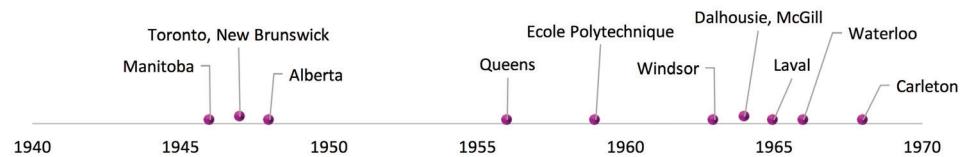


Figure 1: ‘First women’ graduates of Canadian Civil Engineering programs 1940-1970

that 1) the first four started their degrees before the end of WWII, and, 2) the four universities reside in Provincial capital cities.

By the mid 1960s, we were seeing a lot more ‘first women’, including in new programs such as Waterloo, which graduated their first cohort in 1962 and their ‘first woman’ just four years later.

“This is not about favouring one group over another. It’s about removing explicit and implicit barriers, levelling the playing field so that everybody gets to play and they get to play at their best.”

— President/CEO of TD Bank Financial Group receiving a 2010 Catalyst Canada award.

How have we done in the 50 years since then? We are seeing more female professors as instructors, researchers, and leaders. I’m delighted at the number who, like me, are focused on construction-related topics. They serve as excellent role models for both male and female students. But, do more female professors mean more female students?

Of the 30 accredited civil engineering programs in Canada, 14 are in Ontario. Figure 2 shows the 2014 percentages of female civil engineering faculty and students for Ontario only. The Pearson correlation coefficient $R=0.64!$

In the past few years at University of Toronto, the incoming class has been 40% female. The challenge is to maintain that level going forward. So, we are making great inroads toward the 30 by 30 goal. Transitioning stu-

dents to the workplace and licensure is the next step.

Co-op positions are offered by most programs in Canada. These provide an excellent opportunity for all students to experience what working in engineering-related careers might be like.

My own first job out of high school in 1978 was drafting for Midwest Surveys & Services Ltd. in Edmonton. I was very fortunate to be hired by this company when I was so young (I’m barely 40 now...) as they set the standard for professionalism both in the office and in the field. The work was primarily focused on the oilfield industry and it was fascinating. Of the four of us at the drafting tables, two were women. It didn’t seem out of the ordinary at the time, but looking back I recognize how unique it was.

As I progressed, I wanted to get some field experience so that I could better understand the field notes. At one of the jobs where I served as a surveyor’s helper, we had to determine the elevation of the Kelly Bushing on a drilling rig at a remote well site.

Once there, my job was to carry the levelling rod up onto the rig and set it on the bushing. As I approached the rig, a group of men formed at the top of the stairs and started coming down toward me. I was very worried—what did I do wrong? Would I be yelled at? No. They had gathered for the novelty of having a woman on the rig!

They carried my equipment (and almost

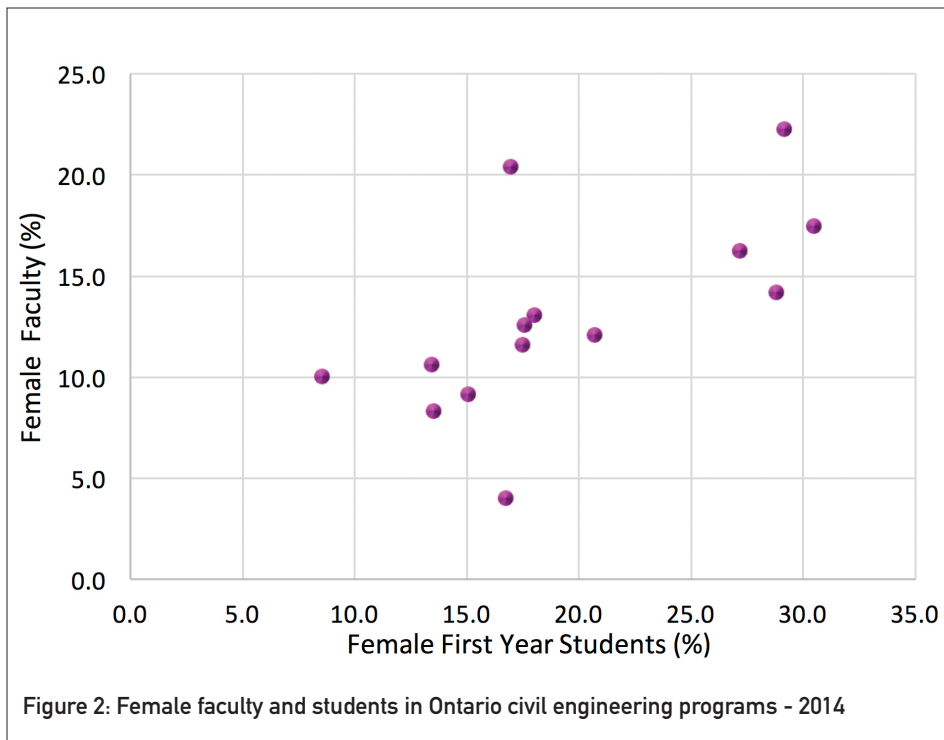


Figure 2: Female faculty and students in Ontario civil engineering programs - 2014

carried me) up the stairs, trying to assist in any way possible. The party chief couldn't help but laugh, saying no other helper had received such celebrity treatment.

On another project, we were met in the field by the oil company executives. While I sharpened stakes, the party chief talked to the executives. At the end of the conversation, one of them made a point of telling me how refreshing it was to have a woman in the field—the language being used was much cleaner!

Unfortunately, not everyone is as lucky as I was in my early work opportunities. A number of the young women who return from their co-op or summer work experiences today are reporting workplace incidents that range from awkward to outright disturbing. Unfortunately, it is making them question whether they want to stay in engineering. Examples of their experiences include:

- Male interns getting meaningful engineering work, while the women are asked to do menial tasks, such as filing and collating documents. When finally offered more responsibility, the engineer asks if she thinks she can do it.
- An engineer insists on referring to a female engineering intern as “Little Girl” despite

the fact that she repeatedly told him her name.

- Going to inspect work at the site, a young female engineer repeatedly receives sexually explicit remarks from a foreman in front of the crew. The remarks are demeaning and diminish her authority.

If we are to achieve 30 by 30, we need to work together to rid our professional workplace of these incidents. The question remains how? I have been researching the topic and have found outstanding inspirations and ideas, some of which I will share with you. To ensure a fair, inclusive, and profitable workplace, here are a few strategies that a company might consider:

- Examine your practices; if women are not getting promoted, why not? If women are leaving the company, why? What systemic biases directly or indirectly affect their performance or the perception of their performance? Find out.
- Regularly check that your male and female employees are being paid equally for the same work.
- Support male and female employees wishing to share their parental leave entitlements. Splitting the time away can lessen the long-term effects on careers.

- Ensure employees seeking guidance have access to supportive mentors.

Additionally, the Government of Canada (available at <http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=26041>) provides a number of prevention activities to reduce the potential for harassment in the workplace. A few of their suggestions are shown below, but I encourage you to check their website for the full list.

- Continually inform employees about your commitment to a respectful workplace.
- Communicate to all employees the informal and formal processes available to them to resolve issues related to harassment.
- Offer workshops on harassment prevention, anger management, meaningful conversations, and collaborative problem solving.
- Provide training and tools to those who are involved in managing conflict and resolving harassment complaints.
- Stay vigilant to the workplace climate.

Finally, in January 2018, the Harvard Business Review published Bryan Cave's Code of Civility (<https://hbr.org/2018/01/make-civility-the-norm-on-your-team>). Given that we are civil engineers, this seems to be a natural for us, and would go a long way toward making a productive respectful workplace. ■

Bryan Cave's Code of Civility

1. We greet and acknowledge each other.
2. We say please and thank you.
3. We treat each other equally and with respect, no matter the conditions.
4. We acknowledge the impact of our behavior on others.
5. We welcome feedback from each other.
6. We are approachable.
7. We are direct, sensitive, and honest.
8. We acknowledge the contributions of others.
9. We respect each other's time commitments.
10. We address incivility.



An Accidental Construction Career: or a Career of Firsts

Linda Newton, Ph.D., FCSCE, PMP
President, Linda Newton Consulting Inc
Adjunct Professor, Department of Civil and
Environmental Engineering, Carleton University

I remember the first course I ever taught. It was a construction engineering course at the University of New Brunswick back in the late 1990s. Since this was a technical elective and thus not a mandatory course, I started by asking my students about their motivation for taking the course. Most of the students were male and many had been exposed to construction as their fathers were in the business. The female students (three in a class of 28) responded that it looked interesting.

My own journey as a construction engineer began in a similar way—it looked interesting. Little did I realise that it would also be marked by a series of ‘firsts’.

I had always been fascinated by how things worked, and from an early age my father supported and encouraged this curiosity by explaining to me how electricity worked, showing me how to change an electric plug, how to boost a car, or take me to construction sites and explain how houses were built.

I had no idea this was engineering, and my father didn’t care that I was a young girl. For various reasons, science took over as my passion in high school and I fully intended to study genetics at university. Then I heard of a military program that paid for one’s university education, but they didn’t need scientists. And so my accidental construction journey began when I headed off in 1980 to the Royal Military College of Canada (RMC) for a career in engineering, all because of free education.

This became one of many ‘firsts’ in my career. I went to the Canadian Forces Recruiting Centre to apply to the university program, and during the course of my application the restrictions governing who could attend RMC changed. I was unexpectedly in the first class of women to enter and graduate from RMC.

I planned to become an aeronautical engineer, or AERE officer. Study mechanical engineering I would, but the presentation by the military engineering team at the start of first year talked about building bridges, roads and blowing them up! Who wouldn’t be excited?

I switched military career paths on the spot. This single, spur of the moment, decision was the second of my accidental career of ‘firsts’ and began my construction career.

In choosing construction, or ‘military’ engineering, I found myself in Chilliwack as one of six women in a group of over 60 male counterparts. The challenges presented were very physical in nature, which one would expect could create conflict between my stronger male peers and us women. Yet, they did not. This pattern of acceptance continued throughout my three phases of engineer training; at times, I was the only woman on my course.

In 1985, after graduation from RMC and completion of my training, I headed to Canadian Forces Base Borden as the Design Officer. I was the first female construction engineering officer in the section; however, the fact that I was female was the least of my concerns. I was a 23-year-old suddenly placed in a position of leadership by virtue of

my military training, and I had immediate responsibility for a design office of 20 men, most old enough to be my father. Gender was irrelevant, my age and experience was the bigger challenge!

I did encounter subtle issues though. I often repeat a story of one of my encounters with my drafting team leader, who I'll call 'Fred'. He would usually call me "dear", not out of disrespect but because that is what he called all women. One afternoon, as he left my office I responded with "Thanks, honeybunch!" He looked at me, raised an eyebrow and asked me what I called him. My reply? 'Well Fred, if you can call me 'dear', I can call you honeybunch.' He never called me 'dear' again, and became one of the most supportive leaders I have ever had work for me.

After four years working in construction engineering at various military bases, I was posted into the position of project officer on one of the largest military construction projects undertaken ever—a joint venture between Canada and the United States to reconstruct the Distant Early Warning (DEW) Line in the arctic (pictured).

Suddenly, I was immersed in a world of design, construction, equipment acquisition and lifecycle management on a phenomenal scale. Again, I was the only woman on the construction side of the project, and again I encountered acceptance and respect.

My commanding officer's ambivalence to my gender became apparent when I was pregnant. The project required site visits to remote project locations in the arctic. I was reviewing my project report and showing photos of my most recent site visit to him. He noticed that one of the photos showed me at the top of a radar tower, visibly pregnant and on a site where the closest medical support was at least 300km away by a small, single engine aircraft. He suddenly said, "You're pregnant. How did you get up the tower?" To which I responded, "I climbed, Sir." And then he asked, "Just how pregnant are you?" "Almost eight months, Sir." At that point, he informed me that I was no longer allowed to travel to the arctic.

After leaving the military and choosing to stay at home for a while with my two young children, I was mindful of the need to keep my engineering skills current. I found myself as only the second female graduate student in the Construction Engineering and Management Group at University of New Brunswick, under Dr. John Christian and Dr. Lloyd Waugh. This led me to teaching the construction engineering course, my introduction to the CSCE Construction Division and my eventual career in asset management.

My gender was not an issue amongst my fellow graduate students. In some ways as a woman and a mother, it was beneficial. I remember being asked if I was worried about my upcoming doctoral comprehensive exams, to which I responded that with two children, two cats, two fish and a hamster, I wasn't really overly worried about it!

I have been fortunate in my military and civilian construction career of firsts to have never experienced serious harassment or ostracization because I was a woman. Yet, I know many who have. We often dwell on why individuals, regardless of gender, are harassed. I have often

Distant Early Warning (DEW) Line project in the arctic.



asked myself, what was different for me? What were the factors at each stage of my career, as a woman and a woman in construction engineering, that led to acceptance and success?

My personal experiences lead me to believe it is the result of the following:

- supportive leadership;
- group dynamics (cohesion); and
- communication, openness and willingness of male colleagues to change.

Let's begin with the first two.

Thirty two women, four per squadron, started as first year cadets at RMC along with 128 male counterparts; 22 women graduated. This success rate was no different than the men, but the experiences of those 22 women definitely were. Only two of the eight squadrons had all four women make it through four years at the college, one of the squadrons had one woman complete all four years at the college.

Why did two squadrons fare so much better and one so poorly?

Each squadron at RMC is led by a squadron commander. He or she is a military officer in charge of overseeing the students (officer cadets), monitoring their progress, evaluating their performance and



After four years working in construction engineering at various military bases, I was posted into the position of project officer on one of the largest military construction projects undertaken ever—a joint venture between Canada and the United States to reconstruct the Distant Early Warning (DEW) Line in the arctic (pictured).

as ‘The Stone Frigate’. Our chant was, “‘Yea Stone; Yea Boat; Yea, Yea, Stone Boat” to which the rest of the cadets would reply, “Stone boats don’t float!”

This spirit led to a long-standing culture that ‘Frigateers’ stuck together. You were a Frigateer first and whatever else (woman, hockey player, bagpiper ...) second. It was the Frigate against the rest of the cadet wing.

I believe it was this cohesion that led to our success as women in the squadron and at the College. I have discussed this many times with my three fellow lady cadets, and we all have the same belief. Again, this did not mean that none of them experienced harassment but if it was, it came from outside the squadron. Inside the squadron, we stuck together. We never knew how our male squadron commander felt about women at RMC. It didn’t matter. We were simply four of the 80 cadets under his charge.

These factors of leadership and group dynamics have followed me throughout my career. I was always supported by leadership and fortunate to be in positions where group dynamics were more important than gender.

So where does communication, openness and willingness to change fit in? Remember my team leader ‘Fred’? He had never worked for a woman before and never really thought that calling a woman ‘dear’, whilst not harassment, was certainly patronizing or sexist.

He didn’t perceive my response as a challenge, rather, it got him thinking. His openness and willingness to change is what set him apart. He then set the example for his staff and others on my team.

And so, an accidental career that began with a desire for subsidised education has led me on an incredible journey of a series of firsts. Several years ago, I gave a career presentation to my daughter’s Grade 10 class. I was asked many interesting questions, but not once did I get asked about being a woman in an engineering field.

On the classroom wall was the quote, “It’s not the destination that’s important, it’s the journey.” When I discuss my journey with other women in construction our journeys are diverse, but they all share a common element. We were supported by our leadership, by our peers and by the willingness of our male colleagues to recognise inappropriate behaviours and change. ■

providing counselling and guidance where needed. This individual provides leadership and is an example for the squadron and the cadets that reside therein.

The squadron with the least number of female graduates had a squadron commander who did not support women being at RMC. He made this clear during the first interview with the young women by telling them so directly. When women in this squadron encountered issues with their male peers, the squadron commander provided no support. In contrast, one of the two squadrons where all four women completed their degrees had a female squadron commander. I wish I could say that this meant that none of the women in that squadron experienced harassment; it did not. However, they had a female role model and someone who not only provided the leadership but could also relate to their experiences and provide support when needed.

The second group of four, my group, belonged to a squadron that was routinely the brunt of many antics and rivalry from the rest of the cadets at the college. One Squadron, the ‘Frigate’, was the original home of the first 18 cadets at RMC and as such, had a ‘band of brothers’ ethos. The building in which we lived was and is still known



The Impact of Chilly Organizational Climates on Female Engineering Interns

Madeleine Santia, BAsC, Industrial Engineering

“You should quit engineering while you’re ahead” ... “If you had had short hair when I interviewed you, I would never have considered hiring you.”

It was the summer of 2016, I had just begun a supply chain internship with a major retailer. In mid-July, I was asked to go on a month-long business trip to Calgary. As an undergraduate student, this was a unique and exciting opportunity: I was working away from home, living in a hotel, enjoying expense-paid dinners, and I had a brand new city to explore and navigate on my own; however, things soon took a turn for the worse.

Within a short time, I became the victim of daily degrading comments that revealed to me, first hand, the hurtful nature of verbal and sexual harassment in the workplace. It was this experience that fuelled my interest in harassment towards female engineering students and led me to pursue research in this area.

This research would prove to be important because ironically, over the following year, similar and more extreme cases of harassment would make their way across newsmedia headlines. Cases such as that of Susan Fowler, a software engineer at Uber who described

the sexual harassment that she experienced at work, or the unveiling of Harvey Weinstein’s decades of sexual harassment and misconduct towards employees and actresses (Fowler, 2017; Kantor & Twohey, 2017) made headlines. Following this, the year 2017 saw the rise of the “#MeToo” movement in which large numbers of women came forward to detail their experiences with verbal and sexual harassment. These situations, and the perseverance of the individuals who lived through them, became a call to action among all ages, genders, occupations and industries.

At a university level, my experience seemed

to suggest that harassment, and “chilly climate” still existed (Hall & Sandler, 1982). Hall and Sandler (1982) describe “chilly climate” as a male-dominated environment where overt and subtle forms of discrimination lead to the unequal treatment of women.

Thus, the research for my undergraduate thesis focused on the impact of chilly organizational climates on a particularly vulnerable group—female engineering students.

The insights developed are based on the inductive analysis of a focus group with seven female engineering interns from the University of Toronto who experienced subtle and overt forms of discrimination at work. The participants included in this study worked across a variety of different sectors within engineering including: resources, energy, manufacturing, high-tech, consulting, and retail (see Table 1).

Prior to conducting the focus group, I began by analyzing literature on factors that contribute to chilly organizational climates in engineering education and workplaces, the impact these discriminatory climates had, and the strategies used by female engineers to mitigate the negative impact of discrimination.

These four bodies of literature suggest that female engineers and engineering students experience a wide range of discriminatory structures, norms and practices in school and at work that wear on their professional confidence, identity and sense of professional fit.

Unfortunately, many of the strategies women use to navigate male dominated organizations leave exclusionary structures intact for the next generation of engineers—student interns.

Furthermore, only a very limited amount of research foregrounds the experiences of female engineering interns. Through the study conducted, I attempt to begin to fill this gap.

In my analysis of the focus group, I discovered three key findings: the prevalence of sexually explicit behaviour; undermining of technical skills in the workplace; and how promised supports failed these engineering interns.

Pseudonym	Discipline	Organization Type	Perceived Percentage of Women in Workplace
W1	Engineering Science	Technology	30-40%
W2	Civil Engineering	Resource	1% (W2 was regularly the only woman on the site)
W3	Industrial Engineering	Consulting	25%
W4	Industrial Engineering	Retail	15-20%
W5	Mechanical Engineering	Manufacturing	10% in office but in the factory it was almost exclusively women
W6	Industrial Engineering	Energy	~10% (W6 was the only woman out of 11 people on her team)
W7	Mechanical Engineering	Energy	~40% in office but majority in plant were men

1. Sexually Explicit Behaviour. In a survey of engineering organizations, 69% of female engineers confirmed that they have been victims of sexual harassment (Hewlett et al., 2008). This statistic is pretty staggering and led me to question at what point in their careers this began. When asked, the vast majority of participants in my focus group had already experienced sexual harassment during their internships.

The experiences ranged from inappropriate comments to unwarranted touching. For racialized interns, this was a double blind, as they also had to navigate being at the receiving ends of their supervisor’s inappropriate attention.

For one participant, W3, she said that “[her senior manager] would comment a lot on the fact that I was Asian ... really creepy comments about being Asian so I feel like he had some weird fetish.” For another participant, W2, in the civil engineering industry, she said: “I had to accept either being assaulted or verbally abused in order to do my job because if I didn’t, I was kicked off the job site. There [were] multiple times where if I didn’t accept abuse from my supervisor, I was asked to leave because my head wasn’t in it ... I had to go ... and come back when I was ready to be abused.”

2. Undermining Technical Skills. All of the students in the focus group discussed multiple situations in which their colleagues,

supervisors, and even recruiters undermined their technical skills. They did this by framing female interns as “equity hires”, or giving them gender differentiated assignments.

There are many examples that the participants provided where the female engineering student was treated as an object and had her technical expertise belittled. However, one particularly poignant example comes from W5, who said: “In the time when I overlapped with another intern in my role, he was always sent to do the factory duties and I was always kept to do the administrative duties in the office. And that was never something I had a say in. It was sort of just like, ‘David, go do the factory work. W5 will do these ... the computer work.’”

3. How Promised Supports Failed. In the case of these participants, they sought out their informal networks, primarily family, friends and other interns, rather than approaching HR, safety officers or the university for assistance.

Participants had two main reasons for not using formal supports, these were: they heard that others accessed them and had negative results, or they were not ready to take the risk of the first occurring.

W2 described a situation where the Health & Safety officer at the site sexually and racially targeted one of her female colleagues. She said that after her colleague approached HR, she had to deal with several repercussions

including her complete exclusion from the group as well as the strain that the situation placed on her ability to do her job following the incident.

To illuminate this, W2 said: “There was one girl who was targeted by the Health & Safety officer. He tried to sit her on his knee and like, touched her, and said these weird things... She went to HR and then she was known around site as the HR person. So you couldn't touch her. You couldn't talk to her. Like, just figuratively couldn't touch her. We had to be really careful with what we did with her because we thought, ‘Oh, maybe she'll run to HR.’ And I was like, ‘Man, that's not fair...’”

In summary, across the participants, there was widespread concern, based on direct and indirect experiences, that approaching HR would either do nothing to improve their situation, or could potentially make the situation worse.

All seven female engineering students entered their internships with the aspiration and belief that their placements would help them develop the skills and real world experiences they needed to launch their careers. Over the course of their internships however, they were exposed to subtle and overt instances of discrimination. These experiences had the effect of reducing the participants' identification and desire to stay within the field as they considered the possibility of having these experiences throughout their careers.

This should not be allowed to happen. In order to combat this, I have several recommendations that should be considered regardless of your place within an organization:

1. Better internal support systems should be put in place. This could be as simple as a mentorship system pairing female interns with more senior female engineers, which would help interns navigate their new environments.
2. Review the assignments given to male and female engineering interns to ensure that they do not replicate gender-role stereotypes.



“In the time when I overlapped with another intern in my role, he was always sent to do the factory duties and I was always kept to do the administrative duties in the office. And that was never something I had a say in. It was sort of just like, ‘David, go do the factory work. W5 will do these . . . the computer work.’”

3. Incorporate diversity and inclusion in your organizational definition of safety, and provide training to all employees so they recognize subtle forms of discrimination.
4. Formal structural supports, like HR, need to be reformed so they stop protecting the perpetrator and instead protect the victim. In your organizations, review and adhere to provincial Human Rights legislation to ensure that the burden of proof for sexual harassment does not fall on the victim.
5. Trust that female interns who have completed the same technical training as their male counterparts have an equivalent range of technical skills.

In conclusion, we must explicitly work to make engineering workplaces more hospitable to female engineers by addressing the barriers they face, and by improving the supports available to them when they are on internship. Together, these two strategies will help mitigate the effects of chilly climate on the professional aspirations of female engineers.

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A Seat at the Table

Sheryl Staub-French, Ph.D., P.Eng., Professor of Civil Engineering,
Goldcorp Professor for Women in Engineering, Dean's Advisor on Equity,
Diversity and Inclusion, University of British Columbia

I am the only woman at the table. Again. I have been invited to speak to a project team given my expertise on building information modeling. Although I have done this many times and have worked with many project teams, I still feel hesitant. I have been invited to the table but no one is speaking to me. As the silence stretches out, I get the familiar feeling that maybe I do not belong.

Then I speak. I present my experience, results of my research, and offer recommendations. I am competent, confident and strong.

The feeling in the room shifts. They give me their attention. They treat me with respect. I leave the meeting feeling excited, relieved, and included. This was 10 years ago, but that experience still resonates today. The power of being invited and (eventually) included.

Now, I sit comfortably at the table. And I work to invite and include more women and other represented groups to the table. Not just because it is the right thing to do, but because it is the smart thing to do.

Teams with gender diversity are smarter¹ and more innovative². Diverse organizations perform better³. And in the construction industry, better performing teams have better project outcomes^{4,5}.

At UBC, I have been working on this issue for five years. First as the inaugural holder of the Goldcorp Professorship for Women in Engineering, and more recently as the Dean's Advisor on equity, diversity and inclusion.

Our goal at UBC is 50-50 in Engineering—we believe the engineering profession should reflect the society it serves, which means proportional representation of women and other underrepresented groups.

Over the past eight years, we have gone from 18% to 30% women entering engineering. We have been inviting girls, and they have responded.

But to truly reach parity will require an exponential shift.

“Although progress on STEM occupations has moved moderately faster... it would take Canada 140 years to reach full parity...”⁶

We cannot wait that long. Industry and academia must work together to recruit and retain women in engineering. Now.

At UBC, we have significantly expanded our outreach efforts. Last year we reached 17,000 youth, half of which were girls. We now offer programming for girls in grades 8-12, allowing them to try out engineering, to see how engineers help solve important problems for society, and meet role models.

We are looking at the whole ecosystem in the pathway to engineering, offering training and support to parents, teachers and counselors.

But to keep women in engineering, we have to look at the pathway to the engineering profession. The first five years is critical. We must provide a soft-landing for women entering the profession, and we must create truly inclusive cultures.

At UBC, the long-term goal is to embed diversity and inclusion in all of our systems and structures. All of our first year engineering students now receive training on bias, equity and inclusion. All students in the Civil Engineering program learn about the importance of teamwork and the critical ingredients of respect and inclusion in creating high performing teams, which is taught in our core Construction Management class. We are now looking at how to incorporate this training and other mechanisms to create an inclusive and welcoming culture for all.

In the construction industry, organizations must thoughtfully and deliberately embed the principles of diversity and inclusion within their systems & structures as well. Think of what we have accomplished to create a

culture of safety in our industry. How can we do the same to create a culture of inclusion?

The reality is that everyone has a responsibility for creating inclusive cultures. We cannot expect women to lead this charge. Men must step up as well and be allies.

Organizations must take a leadership role, setting targets, creating gender inclusive policies, increasing the representation of women in top positions, and promoting diversity and training efforts⁷.

Individually, you can work to address your own biases, be socially inclusive, and become an active ally⁸. The next time you are in a meeting, look around. How many women are there? Is there something you can do, to make the other women in the organization feel welcomed? Remember, even small efforts can have a big impact.

Together, we can ensure that everyone has an opportunity to sit at the table.

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Gender Equality in Construction; Where Do We Stand?

Farnaz Sadeghpour, Ph.D., Associate Professor, Department of Civil Engineering, University of Calgary

The federal government has planned for over \$180 billion in infrastructure spending over the next decade (Infrastructure Canada 2016). This is specifically important to our industry, since a major part of infrastructure investments relates to engineering and construction. What is interesting about this budget allocation is that the federal government has also committed to a gender-based analysis on how the budget allocation within this program can affect gender equality in different ways, including employment opportunities.

Accounting for nearly 1.5 million jobs, construction is one of the largest employers in Canada among all industries (StatCan 2017a). Despite the high employment rates, construction is commonly viewed as a male-dominant industry, not offering equal opportunities to all genders. But do we know the magnitude of the gender imbalance in construction industry? Where exactly does construction stand among other industries in terms of gender equality?

Where exactly do we stand?

A quick look at employment records shows that with 12% of female employment, construction actually has the *lowest* female-to-male ratio among all industries (StatCan 2017a – see Figure 1). I have to admit that even though construction is my research area, and I am very well aware of gender disparity in the industry, I was still surprised to see that construction has the 1st rank among all industries – unfortunately this is a 1st rank not to be proud of.

Perhaps the next question would be, how far have we come over the years on gender equality? Is it possible that despite the current low female to male ratio, this percentage still

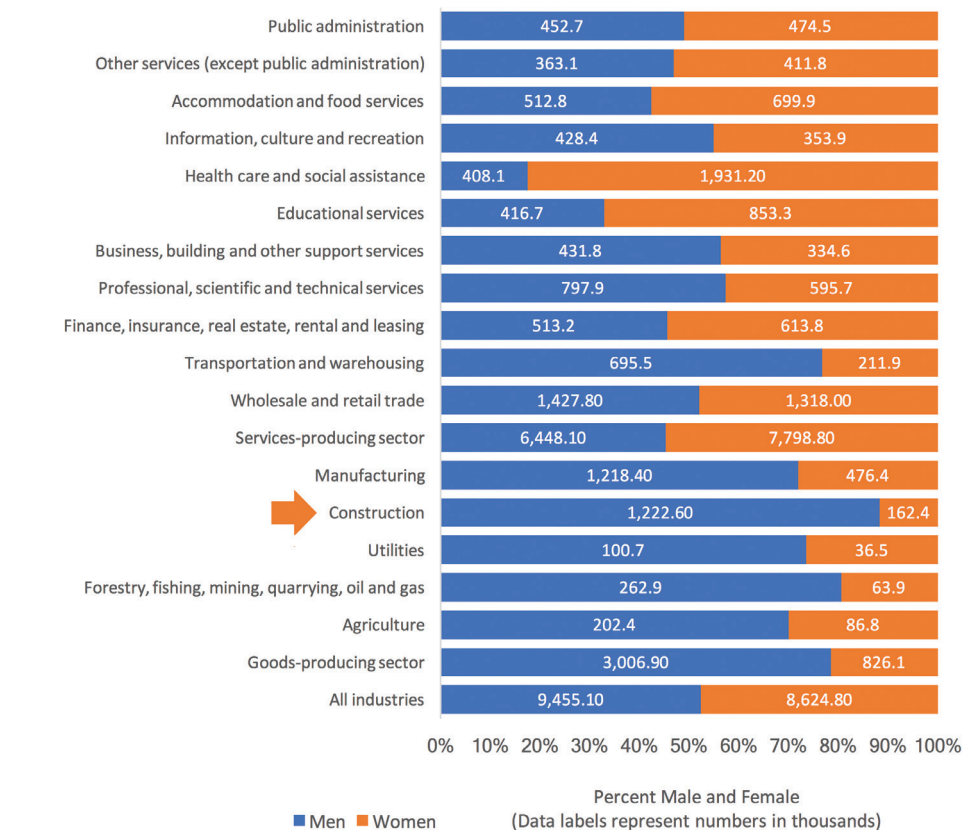


Figure 1. Employment by Industry and Gender in Canada in 2016 (StatCan 2017a)

represents growth over time? Unfortunately, the statistics suggest otherwise. Employment data from Statistics Canada shows a glaring continuity—even slightly worsening situation—in gender disparity in the industry (Figure 2). While male employment has generally increased over the years, the number for female employment in the industry has not significantly changed, representing a decreasing trend in employment percentage of women (StatCan 2017a).

Gender inequality in construction jobs is not new knowledge (CAF 2004). While some may argue that it has to do with women’s interest in applying for construction jobs (which we will discuss below), the perception and interest of employers in hiring women

cannot be overlooked.

Studies have shown that, despite many changes in societal norms, including earning responsibilities for women, women in Canada still have retained the traditional gender role for responsibility for childrearing and household operation (Fox 2009, Barnes 2015, Statistics Canada 2017). This gender-based role assumption can play a strong role when it comes to employment. A study conducted by the Apprenticeship and Trades Certification Commission found that one of the largest barriers in hiring women is that women with children are treated with skepticism about their reliability as an employee (Scullen 2008).

This is probably a result of the assumption

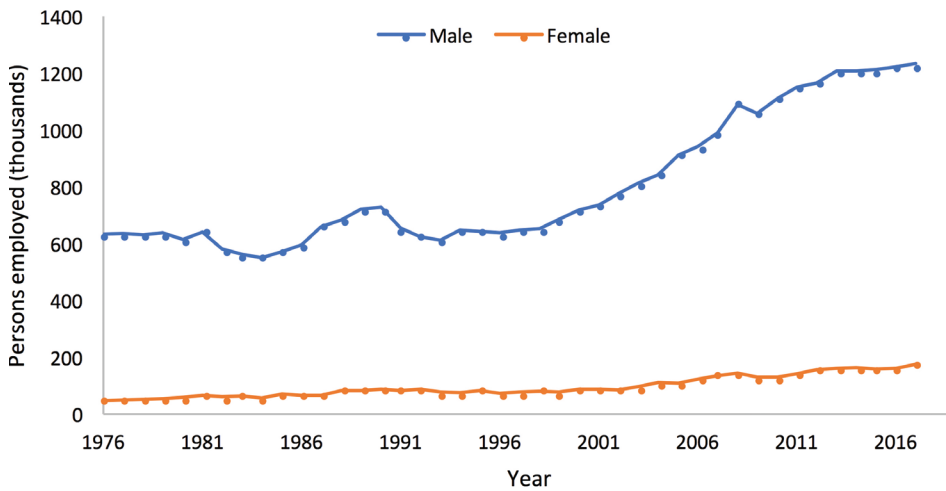


Figure 2. Employment in the construction industry by gender (1976-2016) (StatsCan 2017a)

that women in general cannot focus on work as a first priority, due to personal and family responsibilities, and consequently they will miss more days at work. However, a look at statistics on lost days at work in the construction sector suggests that men and women have very similar records (StatCan 2017b). The average days lost in the past 20 years in the construction industry due to illness, disability, and personal and family responsibility for both men and women is close to 8 days per year; with an average of 7.7 days for men and 7.9 days for women (see Figure 3).

So, we have the worst record in gender equality among all industries (including, say, mining and oil and gas), the situation has not improved over the years, and there still exists an unfair bias towards women when it comes to employment. I believe the only silver lining to the situation is that we can only get better from here! How can we possibly

encourage more women to join the industry?

Building an Inclusive Environment

A study on attracting and engaging women in the workplace conducted for the Canadian Manufacturers and Exporters showed that in industries such as manufacturing and construction, where men dominate the workforce, the men also dominate the culture at work. As a result, the existing gender imbalance in the workplace itself becomes the main repellent factor for women to join male-dominant industries (CME 2017).

Today, it has almost become - dare I say- “trendy”, for organizations to adopt policies to increase diversity and improve equality at workplace. While adopting and defining diversity policies are positive first steps, it is important to make sure that the conversation around diversity is not reduced to lip service or a check-box tick off.

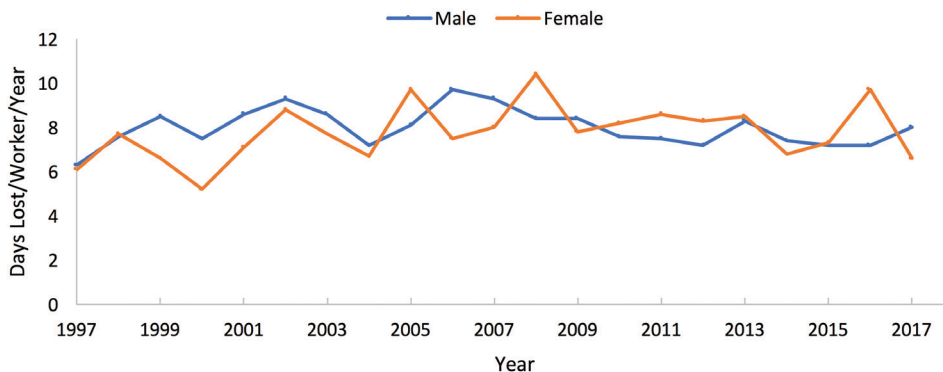


Figure 3. Days Lost per Worker in Construction by Gender (includes days lost due to illness, disability and personal or family responsibility; excludes parental leaves) (StatCan 2017b)

It is equally important to note that diversity by itself is useless without *inclusivity*. Inclusivity involves creating an environment where all people feel valued and respected and where everyone will have access to the same opportunities (Riordan 2014).

It would not mean much if more women are hired to create diversity, but nothing is done to create an environment where women feel included in important conversations, invited to participate in decision-making, or are judged with the same level of criticality as their male counterparts. Diversity without inclusivity, and without ensuring that “subtle biases” are removed, can never solve the gender imbalance problem.

There is an abundance of literature on how to create and foster gender inclusivity in the workplace. For example, the Apprenticeship and Trades Certification Commission provides a step-by-step guideline (Scullen 2008). However, among many factors, it seems that the influence of individuals has one of the highest impacts on attracting and retaining women in the construction industry.

In a survey conducted for the Construction Sector Council (CSC) on the State of Women in Construction in Canada, women who work in construction jobs were asked to identify what has influenced their career choice in construction. It is interesting to note that of the top 14 factors identified (see Figure 4), half of them (highlighted by * in Figure 4) were related to the influence of the individuals around them (CSC 2010).

The reverse can be true about the influence of individuals too. Insensitive and biased behaviour of individuals has proven to have a considerable influence to repel women from joining or staying in male-dominant work environments.

I have had the privilege of serving both as the chair and a member of the Gender and Diversity Committee at Schulich School of Engineering at University of Calgary for a number of years. As part of my role, I have heard from an overwhelmingly large number of female colleagues about difficult or insensitive situations they have had to deal

with on a daily basis while interacting with colleagues in the workplace. I personally believe much of that behaviour is due to a lack of awareness. There are very few people who would knowingly and consciously act biased or insensitive to create uncomfortable situations for their female colleagues. A typical example is when women, returning from their maternity leaves, are greeted by their male colleagues asking how they enjoyed their vacation. (Whether they are not aware what maternity leave is, or they are aware of what it is but in their mind it is equivalent to vacation, can be the subject of an interesting study by itself). It can be imagined how offended the women at the receiving end of these comments can feel.

The fact is that the sensitivities and concerns can be different based on gender. What is considered uncomfortable or unpleasant for one gender may not always be the same for the other. It seems that in male-dominant industries, the written and unwritten work ethics and collegiality etiquettes are formed around male sensitivities and concerns. If we are serious about inclusivity, it is important to familiarize ourselves with the concerns of the other gender(s) too. Point in case, the aforementioned study on attracting and engaging women reported that the majority of men believed that men and women are treated equally at work. The study concluded: “The fact that men do not see a problem, is itself part of the problem” (CME 2017).

In view of the individuals’ influence, I would like to conclude by inviting everyone to commit to a genuine reflection on what we can do as individuals to make our workplaces more inclusive environments:

- Are there areas where we can change or improve our *own perspective* and behaviour?
- Are there areas where we can impact our *work environment* as individuals?
- Can we impact the position of our *learned societies* (such as CSCE) to improve the gender imbalance in our industry?

While reflecting on these questions, keep in mind that as an individual, everyone can

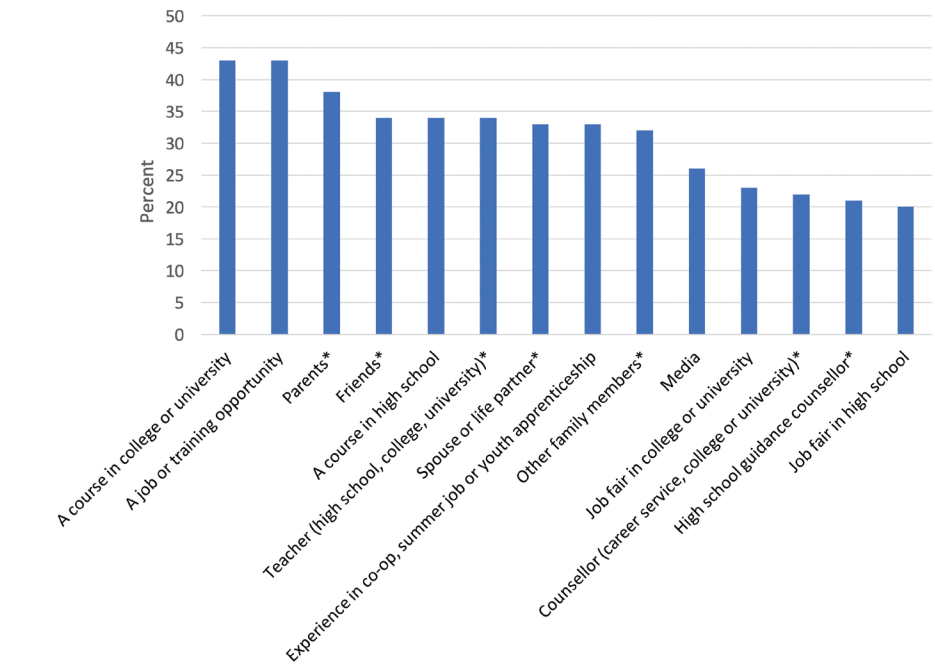


Figure 4. Top factors influencing women to choose construction as their career (CSC 2010)

make a significant impact on creating an inclusive environment in our male-dominant industry. However, it is specifically important to have men on board. Gender equality cannot possibly be achieved by women alone. We are in this together. Let’s keep this conversation alive, “Because it is 2015” was three years ago!

So, where do *you* stand?

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Meeting Seismic Design Requirements with the new Masonry Design Standard CSA S304-14

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This course will provide a detailed overview of the new changes to the 2014 edition of the CSA S304, which are viewed as a substantial improvement to the 2004 standard. Design and detailing examples will be presented that illustrate how masonry seismic design has evolved to meet the requirements of the 2015 NBCC and how these changes will once again facilitate loadbearing masonry in post-disaster structures.

It is presented by Bennett Banting, Ph.D., P.Eng., the Masonry Research and Development Engineer at the Canada Masonry Design Centre (CMDC). Bennett's Ph.D. thesis contributed directly to several major changes to the new seismic design chapter of 2014 CSA S304. He is recipient of several awards and served as Chair of the Technical Committee for the 13th Canadian Masonry Symposium (2017). ■

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Satisfaire aux exigences de la conception sismique avec la nouvelle norme de conception en maçonnerie CSA S304-14

Vancouver, Edmonton, Calgary, Ottawa, Toronto - du 17 au 26 septembre 2018

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Ce cours fournira un aperçu détaillé des nouveaux changements apportés à l'édition 2014 de la norme CSA S304, qui sont considérés comme une amélioration substantielle par rapport à la norme de 2004. Des exemples de conception et de détails illustrant comment la conception sismique de la maçonnerie a évolué pour répondre aux exigences du CCNB 2015 et comment ces changements faciliteront à nouveau la maçonnerie porteuse dans les structures post-catastrophe seront présentés.

Il est présenté par Bennett Banting, Ph.D., P.Eng., Ingénieur en recherche et développement en maçonnerie du Centre canadien de la conception en maçonnerie (CMDC). Sa thèse de doctorat a contribué directement à plusieurs changements majeurs apportés au nouveau chapitre sur la conception sismique de la norme CSA S304 de 2014. Il a reçu plusieurs prix et a été président du comité technique du 13e symposium canadien sur la maçonnerie (2017). ■

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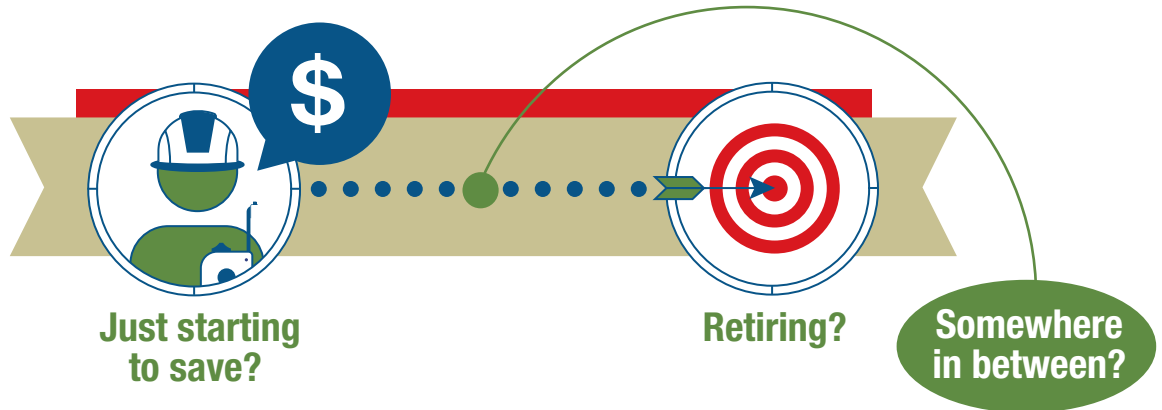


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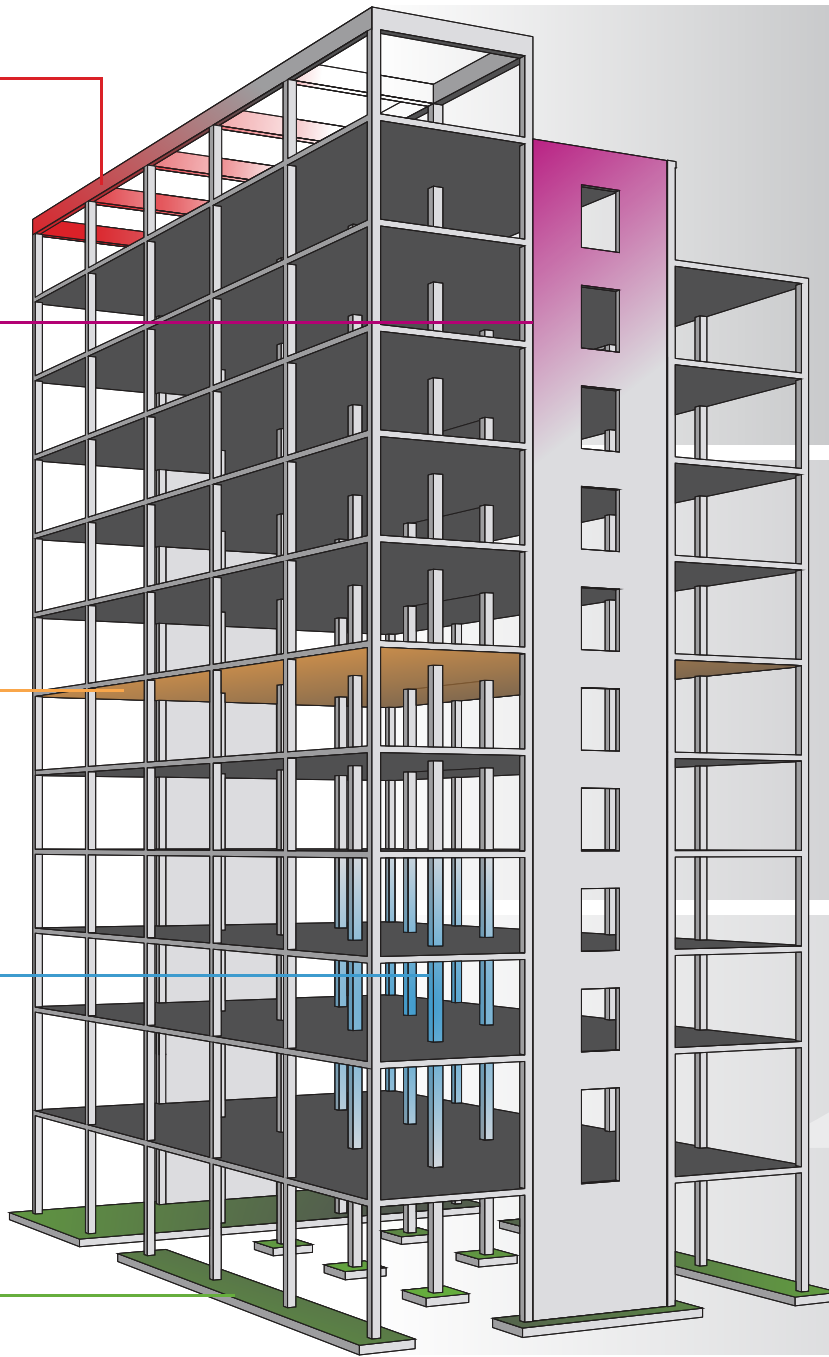
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